

## ABSTRACT OF THE DISCLOSURE

A system and method for controlling the inflation, ablation, and deflation of a balloon catheter. The system includes a balloon catheter, a console, having a pressurized gas or liquid inflation source, and an umbilical system to deliver pressurized coolant to the balloon catheter. The system comprises a PID (Proportional Integral Derivative) controller or other pressure-sensing device that monitors the amount of pressure and volume within the balloon catheter. During inflation, the pressure and/or volume of fluid within the balloon is maintained at a target amount in order to provide sufficient mechanized pressure against the desired target region. The system limits the inflation pressure such that a safe quantity of gas would be released should a leak occur. If the amount falls below a certain threshold level, gas or fluid egress is presumed and the inflation process is halted. In one embodiment, an intermediate console is placed between the console and the balloon catheter and coupled thereto. If a leak is detected, a shut off valve in the intermediate station is activated and the flow of pressurized coolant is interrupted. The balloon catheter can be re-inflated by a separate coolant source in the intermediate station or by a syringe. A further embodiment provides a second balloon to envelope the first balloon and in order to provide a safety vacuum between the two balloons.